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EXAMINER

NOGUEROLA, ALEXANDER STEPHAN

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary**Application No.**

10/660,308

Applicant(s)

GONCALVES, ANTONIO M.

Examiner

ALEX NOGUEROLA

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2, 4-14, 17, 18, 20-41 and 47 is/are allowed.
- 6) ☒ Claim(s) 1, 3, 15, 19 and 42-46 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| <p>1) <input type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/23/04</u>.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</p> <p>6) <input checked="" type="checkbox"/> Other: <u>IDS of 9/10/03</u>.</p> |
|---|---|

Claim Rejections - 35 USC § 112

1. Claim 46 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention:

a) Claim 46, lines 8 and 10: the phrases beginning with “so as to” are incomplete.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 19, and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Serwer (US 4,693,804), hereafter “Serwer”.

Addressing claim 1, Serwer teaches a cassette for use in an electrophoresis apparatus (the abstract), the cassette having an upper portion and a lower portion, the cassette (10) comprising:

Art Unit: 1753

at least two liquid reservoirs formed in the cassette spaced apart from one another, each reservoir being adapted to receive a liquid (32, 34, 36, 38 in Figures 1 and 2A);

a substrate support located between the liquid reservoirs (gel platen 64);

at least one port in fluid communication with at least one of the reservoirs and extending to an external surface of the cassette (slots 110);

at least one electrode located within each liquid reservoir (50); and

at least one electrical contact located on an external surface of the cassette and electrically connected to the at least one electrode so as to permit current to pass between the electrical contact and the electrode (48 and see col. 3, ll. 25-33).

Addressing claim 3, four liquid reservoirs and four electrodes as claimed are taught by Serwer (for the liquid reservoirs note 32, 34, 36, 38 in Figures 1 and 2A. For the four electrodes note electrodes 50). As for the claimed two ports for supplying liquid and at least one port for venting gas, note that the stated purposes for these ports are intended uses that, barring a contrary showing, do not confer any distinguishing structural features to the ports themselves; that is, a port for supplying liquid can be identical in structure to a port for venting gas, although weight will be given to the structural relationship between a port and another element of the device, such as location or position. Serwer teaches four ports (slots 110). Any two of the ports can be considered to be Applicant's claimed ports for supplying liquid and either of the remaining two ports can be considered to be a port for venting gas, as claimed.

Addressing claim 19, that the substrate support, which rests on a lower portion of the cassette, is removably attached to the lower portion of the cassette is implied by col. 5, ll. 37-38, which teaches that the cassette may be removed from the support.

Addressing claim 46, Serwer teaches a cassette for use in an electrophoresis apparatus (the abstract), the cassette having an upper portion and a lower portion, the cassette (10) comprising:

- a substrate support (gel platen 64) located within a substrate chamber;
- at least one inlet port (110) in fluid communication with the substrate chamber and extending to an external surface of the cassette;
- at least one outlet port (110) in fluid communication with the substrate chamber and extending to an external surface of the cassette;
- at least two electrodes (50) located within the cassette, one electrode positioned so as to within the flow path of a fluid passing through the at least one inlet port, and one electrode positioned so as to within the flow path of a fluid passing out the at least one outlet port; and
- at least two electrical contacts located on an external surface of the cassette, each electrical contact being electrically connected to an electrode so as to permit current to pass between the electrical contact and the electrode (48 and see col. 3, ll. 25-33).

Note that whether a port is used as an inlet port or an outlet port is only intended use that does not structurally limit the claimed device.

Art Unit: 1753

4. Claims 1, 15, 19, and 46 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kaplan (US 4,234,400), hereafter "Kaplan".

Addressing claim 1, Kaplan teaches a cassette for use in an electrophoresis apparatus (the abstract), the cassette having an upper portion and a lower portion, the cassette (Figure 7) comprising:

at least two liquid reservoirs formed in the cassette spaced apart from one another, each reservoir being adapted to receive a liquid (18 and 24 in Figure 5);

a substrate support located between the liquid reservoirs (bed 10 or trough 30);

at least one port in fluid communication with at least one of the reservoirs and extending to an external surface of the cassette (66 in Figure 7);

at least one electrode located within each liquid reservoir (76); and

at least one electrical contact located on an external surface of the cassette and electrically connected to the at least one electrode so as to permit current to pass between the electrical contact and the electrode (sockets 78 and see col. 4, ll. 35-39).

Addressing claim 15, Kaplan teaches a heat sink as claimed (col. 4, ln. 64 – col. 4, ln. 7).

Addressing claim 19, if trough 30 is taken to be the support then it is removable from the cassette (Figure 7).

Addressing claim 46, Kaplan teaches a cassette for use in an electrophoresis apparatus (the abstract), the cassette having an upper portion and a lower portion, the cassette (Figure 7) comprising:

- a substrate support (bed 10 or trough 30) located within a substrate chamber;
- at least one inlet port (72) in fluid communication with the substrate chamber and extending to an external surface of the cassette;
- at least one outlet port (70) in fluid communication with the substrate chamber and extending to an external surface of the cassette;
- at least two electrodes (76) located within the cassette, one electrode positioned so as to within the flow path of a fluid passing through the at least one inlet port, and one electrode positioned so as to within the flow path of a fluid passing out the at least one outlet port; and
- at least two electrical contacts located on an external surface of the cassette, each electrical contact being electrically connected to an electrode so as to permit current to pass between the electrical contact and the electrode (sockets 78 and see col. 4, ll. 35-39).

Note that whether a port is used as an inlet port or an outlet port is only intended use that does not structurally limit the claimed device.

5. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Nakanishi et al. (US 6,454,925 B1), hereafter "Nakanishi".

Addressing claim 1, Nakanishi teaches a cassette for use in an electrophoresis apparatus (the abstract), the cassette having an upper portion and a lower portion, the cassette comprising:

- at least two liquid reservoirs formed in the cassette spaced apart from one another, each

Art Unit: 1753

reservoir being adapted to receive a liquid (buffer tanks **9** in Figure 4A);

a substrate support located between the liquid reservoirs (grooves **7** and **8**);

at least one port in fluid communication with at least one of the reservoirs and extending to an external surface of the cassette (**10a**, **10b**, **10c**, and **10d**);

at least one electrode located within each liquid reservoir (**76**); and

at least one electrical contact located on an external surface of the cassette and electrically connected to the at least one electrode so as to permit current to pass between the electrical contact and the electrode (electrodes **35a**, **35b**, **35c**, and **35d**. Also see col. 4, ll. 35-39).

Addressing claim 3, four liquid reservoirs and four electrodes as claimed are taught by Nakanishi (for the four liquid reservoirs note buffer tanks **9** in Figure 4A. For the four electrodes note electrodes **76**). As for the claimed two ports for supplying liquid and at least one port for venting gas, note that the stated purposes for the ports are intended uses that, barring a contrary showing, do not confer any distinguishing structural features to the ports themselves; that is, a port for supplying liquid can be identical in structure to a port for venting gas, although weight will be given to the structural relationship between a port and another element of the device, such as location or position. Nakanishi teaches four ports (**10a**, **10b**, **10c**, and **10d**). Any two of the ports can be considered to be Applicant's claimed ports for supplying liquid and either of the remaining two ports can be considered to be a port for venting gas, as claimed.

Art Unit: 1753

6. Claim 42 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by the JPO abstract of Tanaka (JP 2001-1188061 A).

7. Claim 43 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Slater et al. (US 6,146,511). See the abstract and Figure 1a.

8. Claim 44 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Scott et al. (US 6,139,709). See the abstract and Figure 1.

9. Claim 45 is rejected under 35 U.S.C. 102(e) as being anticipated by Meier et al. (US 6,592,735 B1). See the abstract and Figures 2 and 4. Not that the substrate is clearly an "electrophoresis" substrate since an electrical field is used to separate biomolecules through a gel.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 1 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier et al. (US 6,592,735 B1), hereafter "Meier", in view of Serwer (US 4,693,804), hereafter "Serwer".

Addressing claim 1, Meier teaches a cassette for use in an electrophoresis apparatus (implied the abstract, which teaches a machine configured so that an electric field can be applied across a DNA sequencing gel), the cassette having an upper portion and a lower portion, the cassette comprising:

at least two liquid reservoirs formed in the cassette spaced apart from one another, each reservoir being adapted to receive a liquid (ion reservoirs shown in Figure 2);

a substrate support located between the liquid reservoirs (support film shown in Figure 4);

at least one electrode located within each liquid reservoir (platinum wire electrodes shown in Figure 2); and

at least one electrical contact located on an external surface of the cassette and electrically connected to the at least one electrode so as to permit current to pass between the

Art Unit: 1753

electrical contact and the electrode (electrical contacts as claimed are shown, but not labeled, in Figure 2).

Meier does not mention providing at least one port in fluid communication with at least one of the reservoirs and extending to an external surface of the cassette, although no covers are provided on the reservoirs, so the reservoirs have an opening in fluid communication with an external surface of the cassette.

Serwer teaches a cassette for use in electrophoresis for use in an electrophoresis apparatus (the abstract), the cassette comprising:

at least one port in fluid communication with at least one reservoir and extending to an external surface of the cassette (slots 110). The at least one port is formed by a slot in a cover over the reservoir. It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide over the reservoirs a cover having a slot, which forms a port, as taught by Serwer in the invention of Meier because this will limit exposure of the buffer in the reservoirs to the atmosphere. So the chance of contaminating the buffer will be lessened and the temperature of the buffer can be better controlled.

Addressing claim 15, Meier teaches a heat sink as claimed (Figure 2).

Allowable Subject Matter

13. Claims 2, 4-14, 17, 18, 20-41, and 47 are allowed.

Art Unit: 1753

14. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter:

a) Claim 2: the combination of limitations requires that each end of the electrophoretic substrate extend into a liquid reservoir. In Meier only one end of the electrophoretic substrate extends into a liquid reservoir (Figure 2), so that sample may be introduced to the substrate;

b) Claim 4: the combination of limitations requires at least two ports formed in the upper portion of the cassette adapted to permit flow of gas between the outside of the cassette and a liquid reservoir or a pair of non-adjacent liquid reservoirs. In Kaplan the ports the upper portion of the cassette are adapted for electrical contact between the electrodes in the reservoir and a power supply. The ports in the lower portion of the cassette are adapted for circulating buffer flow in the liquid reservoirs;

c) Claim 5, 6, and 17 depend directly or indirectly from allowable claim 4;

d) Claim 7: the combination of limitations requires that “at least part of the upper portion of the cassette is movable with respect to the substrate support when the when the upper portion is engaged with the lower portion of the cassette”;

e) Claims 8-11 depend directly or indirectly from allowable claim 7;

f) Claim 12: the combination of limitations requires the gasket to have two spaced apart cut-outs, each cut-out defining at least a portion of a reservoir;

g) Claims 13 and 14 depend from allowable claim 12;

h) Claim 16: the combination of limitations requires the liquid ports and the at least one vent port to extend to one side or the bottom surface of the lower portion of the cassette. In Nakanishi and in Serwer all of the ports extend to the top surface of the upper portion of the cassette.

i) Claim 18: the combination of limitations requires “a porous layer disposed on the substrate support and extending into the liquid reservoirs.” In Meier only one end of the electrophoretic substrate, which is a porous gel, extends into a liquid reservoir (Figure 2), so that sample may be introduced to the substrate;

j) Claim 20: the combination of limitations requires a removable attachment permitting the substrate support to be slid laterally into the body;

k) Claim 21: the combination of limitations requires "at least two vent ports formed in the cover, each vent port extending between an associated liquid reservoir or pair of non-adjacent liquid reservoirs and an external surface of the cassette for channeling gas between the reservoir or pair of non-adjacent reservoirs and the outside of the cassette."

In Kaplan the ports the upper portion of the cassette are adapted for electrical contact between the electrodes in the reservoir and a power supply. The ports in the lower portion of the cassette are adapted for circulating buffer flow in the liquid reservoirs. It should be noted that although in Nakanishi two of the ports in the cover could possibly be construed as vent ports the body is not removably engageable to the cover. The body is fused to the cover by vacuum heating at 600°C for several hours (col. 7, ll. 20-24).

l) Claims 22-34 depend directly or indirectly from allowable claim 21;

m) Claim 35: the combination of limitations requires "docking the cassette in the docking station of the apparatus such that the liquid buffer source and the waste container are in fluid communication with the reservoirs, and that the power source is in electrical communication with the electrodes;"

n) Claim 36: the combination of limitations requires “docking the cassette in the docking station of the apparatus such that the liquid buffer source and the waste container are in fluid communication with the reservoirs, and that the power source is in electrical communication with the electrodes;”

o) Claim 37 requires conveying a substrate support on which there is a plurality of substrates. In Saito (JP 02-195249 A) a single substrate in the form of a continuous strip is conveyed through several reservoirs over a series of rollers;

p) Claim 38: the combination of limitations requires “docking the cassette in the docking station of the apparatus such that the at least one liquid buffer source and the waste container are in fluid communication with the reservoirs, and that the power source is in electrical communication with the electrodes;”

q) Claim 39: the combination of limitations requires a gas source and “a gas manifold including at least one dispenser at the docking station, at least one conduit for conveying gas between the gas source and the dispenser.” In Manz (US 5,180,480) the docking station comprises at least one buffer source (from which electrolyte lines 13c extend) and a waste storage container (implied by discharge line 22). However, a gas source and a gas manifold are not disclosed by Manz;

r) Claim 40: the combination of limitations requires at least one gas source and “a gas manifold including at least one dispenser at the docking station, at least one conduit for conveying gas between the at least one gas source and the dispenser.” In Manz (US 5,180,480) the docking station comprises at least one buffer source (from which electrolyte lines 13c extend) and a waste storage container (implied by discharge line 22). However, a gas source and a gas manifold are not disclosed by Manz;

s) Claim 41: the combination of limitations requires “ a conveyance system for receiving a series of substrates, the conveyance system including a substrate support, the conveyance system adapted to transport the substrate through at least one liquid reservoir.” In Saito (JP 02-195249 A) the electrophoresis device is configured to convey a single substrate in the form of a continuous strip through several reservoirs over a series of rollers; and

t) Claim 47: the combination of limitations requires “docking the cassette in the docking station of the apparatus such that the liquid buffer source is in communication with the at least one inlet and the waste container is in fluid communication with the at least one outlet, and that the power source is in electrical communication with the electrodes.”

Oath/Declaration

16. The page that contains the inventor's signature in the Declaration and Power of Attorney of September 10, 2003 has not been received or has been lost during scanning of the application. Applicant is requested to provide a copy of this missing page of the Declaration.

17. The identifying application information required on page 1 of the Declaration and Power of Attorney of September 10, 2003 has not been provided.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1753

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Alex Noguera

3/22/04
Primary Examiner
TC1753